

ABSTRACT OF THE DISCLOSURE

An extensible fluid permeable substrate having at least one direction of extensibility in an X-Y plane is provided with improved retraction to make the composite material suitable for disposable garment applications with minimal application of coalesced elastomeric materials. A pattern of untensioned coalesced elastomeric stripes is applied on an X-Y plane surface of the substrate in low add-on amounts of between about 20% to about 100% of the substrate basis weight to make the composite material. The longitudinal axes of the coalesced elastomeric stripes are oriented substantially along the direction of substrate extensibility and desired retraction of the composite material. By applying the minimal amount of elastomer necessary in an open pattern, the economical composite material also avoids negative by-products of elastic coatings or films such as bad hand, bad drape, loss of fluid transfer or intake ability and lack of breathability. In a particular embodiment the coalesced elastomers are applied as electrospun microfibers yielding a very low add-on rate with fluid permeable coalesced elastomer areas while providing improved retractive properties to the substrate.



Specimen No.	Heater section	Load @ 30 Up Op 1		Load @ 30 Dn Op 1		Load @ 30 Up Op 2		Load @ 30 Dn Op 2		TEA (Bk) Op 1		TEA (Fm) Op 1		% Heater Loss Op 1		TEA (Bk) Op 2		TEA (Fm) Op 2		% Heater Loss Op 2		Immed Str % Op 1		Immed Str % Op 2		Load Loss @ 50%	
		d	g	d	g	d	g	d	g	kg/mm	kg/mm	%	kg/mm	kg/mm	%	kg/mm	kg/mm	%	%	%	%	d	g	d	g		
Control	1	0.0%	335	831	-18	678	0.194	0.033	82.8	33	767	-22	655	0.086	0.032	63.3	35.387	36.7	210.974								
	2	0.0%	473	964	-15	787	0.254	0.042	83.6	58	888	-21	759	0.11	0.042	61.6	34.199	35.538	212.451								
	3	0.0%	409	934	-17	763	0.227	0.041	81.8	42	862	-22	738	0.103	0.04	61.2	34.682	36.025	210.054								
	4	0.0%	373	861	-18	697	0.208	0.035	83.2	34	789	-23	673	0.091	0.034	62.8	35.341	36.559	218.703								
1SP	1	35.0%	480	933	-3	760	0.26	0.049	81.1	73	848	-10	726	0.112	0.045	59.6	32.512	34.27	222.332								
	2	35.0%	539	1049	-3	851	0.292	0.055	81.2	78	950	-10	809	0.125	0.051	58.8	32.37	34.144	228.89								
	3	35.0%	601	1154	0	939	0.323	0.06	81.3	88	1051	-9	889	0.14	0.059	58	31.667	33.689	220.98								
2SP	1	65.0%	516	1008	3	832	0.279	0.059	79.9	95	916	-7	787	0.128	0.054	58.2	31.151	33.206	219.291								
	2	65.0%	618	1088	6	889	0.323	0.063	80.5	116	980	-5	842	0.142	0.06	57.9	30.488	32.688	211.628								
	3	65.0%	670	1198	9	987	0.353	0.072	79.6	123	1092	-4	941	0.158	0.068	57	30.132	32.298	214.511								
3SP	1	40.0%	629	1138	5	941	0.332	0.059	79.3	107	1041	-6	899	0.147	0.064	56.7	30.714	32.775	210.6								
	2	40.0%	550	1059	-2	878	0.293	0.057	80.5	77	977	-10	833	0.13	0.055	57.8	32.119	33.98	220.908								
	3	40.0%	520	953	0	790	0.272	0.052	80.9	83	873	-9	750	0.119	0.05	58.3	31.793	33.639	212.73								
4SP	1	100.0%	687	1142	19	930	0.356	0.059	81.2	148	1016	4	875	0.155	0.064	58.4	28.52	31.059	233.821								
	2	100.0%	708	1192	18	983	0.373	0.072	80.8	150	1071	2	922	0.164	0.07	57.3	28.817	31.25	226.97								
	3	100.0%	731	1184	23	976	0.395	0.073	80.9	168	1082	6	906	0.168	0.07	58.1	28.055	30.633	234.636								
5SP	1	60.0%	619	1133	9	926	0.329	0.055	80.4	115	1031	-2	890	0.146	0.063	57.2	30.133	32.303	215.08								
	2	60.0%	676	1154	11	960	0.352	0.068	80.7	130	1052	-2	897	0.154	0.065	57.9	29.761	32.053	222.192								
	3	60.0%	758	1339	13	1094	0.398	0.078	80.4	140	1219	-1	1082	0.177	0.077	56.6	29.602	31.806	213.999								

Table 1

[illegible]

Table 2

Mechanical Properties of Screen Printed Materials

Table 3

	Elastomer add-on wt%	% Hyster Loss Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc2 %	% Reduction vs Control %	Modulus of Elasticity psi	% Improve vs Control %
Control	0%	83%	N/A	35%	N/A	36%	N/A	21	N/A
Sample 1sp	35%	81%	2%	32%	10%	34%	6%	51	140%
Sample 2sp	40%	80%	3%	32%	11%	33%	7%		
Sample 3sp	60%	81%	3%	30%	16%	32%	11%	64	200%
Sample 4sp	65%	80%	4%	31%	14%	33%	9%	70	230%
Sample 5sp	100%	81%	2%	28%	20%	31%	14%	121	470%

1 Mechanical Properties of E-Spin Materials

Table 4

	Elastomer add-on wt%	% Hysteresis Loss Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 2 %	% Reduction vs Control %	Modulus of Elasticity psi	% Improve vs Control %
Control	0%	83%	N/A	35%	N/A	36%	N/A	21	N/A
Samples	2.5%	81%	3%	32%	8%	34%	6%	31	40%
Samples	5%	80%	3%	34%	4%	35%	2%	39	80%
Samples	7.5%	81%	2%	32%	9%	34%	6%	43	100%
Samples	9%	80%	4%	32%	10%	34%	6%	.	.
Samples	10%	81%	2%	33%	6%	35%	4%	44	100%